

**Commonwealth of Massachusetts
Office of Consumer Affairs & Business Regulation
Division of Energy Resources**

**RENEWABLE ENERGY PORTFOLIO STANDARD
ADVISORY RULING**

**FOR
GREENVILLE STEAM COMPANY'S PROPOSED PROJECT TO
RE-TOOL ITS BIOMASS POWER PLANT**

July 8, 2004

1. Advisory Ruling Request by the Greenville Steam Company

Greenville Steam Company ("GSC") has requested that the Massachusetts Division of Energy Resources ("DOER" or "the Division") provide an Advisory Ruling with regard to the qualification under the Massachusetts Renewable Energy Portfolio Standard (RPS) of a proposed project to modify its biomass power plant in Greenville, Maine.¹ This document is DOER's response to that request.

The RPS regulations, at 225 CMR 14.06(5),² provide an opportunity for a Generation Unit owner or developer "to request an advisory ruling from the Division to determine whether a Generation Unit would qualify as a New Renewable Generation Unit."³

2. Description of the Proposed Greenville Project

The request from GSC concerns a proposed project for its 1986 biomass Generation Unit (hereafter "Greenville") in Greenville, ME. The proposed project would re-tool Greenville with bubbling fluidized bed technology to meet the "low-emissions, advanced biomass power conversion technologies" criteria of the regulations at 14.05(1)(a)6. Greenville currently has a vibrating grate system, a type of stoker combustion technology, which provides heat to a steam boiler powering a 16 MW steam turbine. The RPS regulations at 14.05 (1)(a)6 categorically exclude stoker combustion technology from RPS qualification. Pursuant to DOER's recent interpretation of its RPS regulations, if a retooled unit, previously ineligible under those criteria, were successful in meeting those criteria, then DOER would deem it qualified as a New Renewable Generation Unit (provided it also met all other relevant criteria).⁴

This Advisory Ruling will address the proposed retooling project's fuels, technology, and air emissions.

¹ The Greenville request was provided as a letter to Dwayne Breger at DOER, dated May 13, 2004, hereafter referenced as the 5/13/04 letter. Amended air emissions information was provided in email messages to Howard Bernstein at DOER, dated July 1 and July 6, 2004, hereafter referenced as the 7/1/04 and 7/6/04 emails.

² Hereafter, all references to the RPS regulations will be to sections of 225 CMR 14.00.

³ More information about Advisory Rulings for MA RPS is at <http://www.mass.gov/doer/rps/advisory.htm>.

⁴ See DOER's *Guideline on the MA RPS Eligibility of Generation Units That Re-tool with Low Emission, Advanced Biomass Technologies*, dated April 16, 2004, and accessible at <http://www.mass.gov/doer/rps/advbio.htm>. Under the *Guideline*, the Vintage Waiver provisions at 14.05(2) cannot apply to units that use stoker combustion because a Vintage Generation Unit must meet all of the relevant requirements of 14.05(1)(a), which for a biomass unit categorically excludes the use of stoker combustion.

3. Discussion of the Project's Proposed Fuels

Greenville currently burns (a) sawmill and lumbering debris (sawdust, bark, and wood chips), (b) waste wood from licensed construction and demolition (C&D) debris processing centers,⁵ and (c) carpet waste trimmings from another company. The first two categories are qualified as Eligible Biomass Fuels under the RPS regulations at 14.02, while the third is not.⁶ However, "GSC will elect not to utilize the latter fuel, nor any other non-qualifying fuels, after the retooling is completed."⁷ Accordingly, with that commitment reflected in Greenville's eventual amended Maine Air Emission License and/or included as a condition of an eventual Statement of Qualification, DOER shall consider the fuels of Greenville to meet the MA RPS definition of Eligible Biomass Fuel at 14.02.

4. Discussion of the Project's Proposed Biomass Technology

The RPS regulations at 14.05(1)(a)6 provide that the qualification of biomass Generation Units is limited to "low-emission, advanced biomass power conversion technologies using an Eligible Biomass Fuel." These criteria are designed to insure that the RPS provides incentives for older, dirtier technologies to be replaced by cleaner and more efficient technologies. DOER also believes that biomass technologies are likely to improve over time in response to the incentives created by the RPS and by other regulatory and market forces responsible for continued technological progress in the electricity generation sector.

GSC's plan is "to replace [Greenville's current] vibrating grate, stoker fed system with a state-of-the-art fluidized bed system,"⁸ namely with a bubbling fluidized bed (FB) system manufactured and installed at Greenville by Energy Products of Idaho (EPI). Based on the description of EPI's system provided in GSC's 5/13/04 letter, and pending further details submitted with an eventual Statement of Qualification Application, DOER anticipates finding that the proposed technology meets the "advanced technology" criterion of the RPS regulations. This determination is consistent with prior Advisory Rulings for PSNH's proposed re-tooling and biomass repowering at its Schiller Station in New Hampshire, EcoPower's proposed new biomass unit in Massachusetts, Boralex's proposed retooling of one or the other of two biomass units in Maine, and Burlington Electric's proposed retooling of its McNeil Station in Vermont, all of which plan to use fluidized bed technologies.⁹

5. Discussion of the Project's Air Emissions

A Generation Unit using an Eligible Biomass Fuel and advanced technology also must meet the criterion of "low-emissions" in order to qualify a New Renewable Generation Unit for the RPS, per the regulations at 14.05(1)(a)6. This criterion does not set specific emission targets. Rather, the threshold for eligibility is expected to become more stringent as biomass energy conversion and emission control technologies improve. In addition, that threshold might differ among fuels, technologies, project scale, and site-specific conditions – as determined by the Massachusetts Department of Environmental Protection. Under the RPS regulations at 14.05(1)(a)6.a, a generator must receive a valid air permit from its appropriate state air quality regulatory agency to qualify as

⁵ As noted below in section 5, the use of C&D waste, if it contains enough gypsum board, may raise SO₂ emissions and necessitate modification of the plant's pollution control methods.

⁶ The carpet fibers are derived from recycled plastic and other petroleum-derived materials.

⁷ 5/13/04 letter.

⁸ Ibid.

⁹ Prior Advisory Rulings can be accessed via links at <http://www.mass.gov/doer/rps/advisory.htm>.

an eligible biomass generator. The same subsection also provides that the project “must . . . demonstrate to the satisfaction of the Division that its emission rates are consistent with emission rates for comparable biomass units as prescribed by the Massachusetts Department of Environmental Protection.”¹⁰

DOER appreciates the level of detail on both emissions and emission controls that GSC has provided in its 5/13/04 letter. Greenville’s projected emission rates, as amended in its two emails, do appear to be “consistent with emission rates for comparable biomass units,” in the judgement of the MA DEP. However, please note that no truly comparable biomass unit actually exists. The most recently constructed biomass plant in Massachusetts is Tractebel's Pinetree Power Station in Westminster, dating from 1992, which employs a RPS-ineligible stoker combustion system. Three fluidized bed boilers in Maine that have received RPS Statements of Qualification under the Vintage Waiver provision of the regulations are not re-tooled plants.¹¹ The only Advisory Ruling requests for biomass plants that propose to re-tool with fluidized bed technology, thus far, did not provide any projected emission rates.¹² Advisory Rulings for new, not re-tooled, fluidized bed plants project NO_x emission rates of 0.08 and 0.085 pounds per mmBtu,¹³ but those are lower than the rate that would be regarded as “low-emissions” for a re-tooled plant.

As of July 6, 2004, among the various requests for Advisory Rulings, only one re-tooling project, Ware Cogen in Ware, MA, provides emission rates, but those are for re-tooling an old boiler with a Wellons, vertical, close-coupled gasifier, not with bubbling fluidized bed technology; therefore, Ware Cogen is also not truly comparable. However, as the only other re-tooling project with emissions projections, DOER feels that it would be useful to provide here a side-by-side comparison.¹⁴ The Ware Cogen NO_x emission rate is subject to change based on the results of NO_x/ammonia optimization testing following startup. Greenville's agreed rate of 0.10 #/mmBtu likewise would be subject to finalization based on the results of such optimization testing.¹⁵

	GREENVILLE STEAM COMPANY PROJECTIONS		WARE COGEN CONDITIONAL APPROVAL (MA DEP)	
Pollutant	#/mmBtu	Control Method	#/mmBtu	Control Method
SO ₂	0.035	Fuel specification	0.13	Fuel specification
NO _x	0.10	SNCR	0.093	SNCR/good combustion control
PM	0.03	Multicyclone/ESP	0.015 (PM-10)	Multicyclone/baghouse
CO	0.16	Good combustion control	0.25	Good combustion control
VOC	0.035	Good combustion control	0.01	Good combustion control
NH ₃	10 PPM		25 PPM	

¹⁰ If the air quality regulations applicable in the jurisdiction where the unit is located do not require an air permit, then the unit must satisfy the requirements of the RPS regulations at 14.05(1)(a)6.c. This does not apply here.

¹¹ The three Maine plants are Indeck West Enfield (1987), Indeck Jonesboro (1987), and Worcester Energy Company (1989). The Vintage Waiver provision is in the RPS regulations at 14.05(2).

¹² Those plants are Boralex Livermore Falls, Boralex Stratton, and Burlington Electric’s McNeil Station, for which Advisory Rulings can be accessed at <http://www.mass.gov/doer/rps/advisory.htm>.

¹³ Those plants are Schiller and EcoPower, accessible at <http://www.mass.gov/doer/rps/advisory.htm>.

¹⁴ Ware Cogen emission information is from a 12/30/03 Conditional Approval from the MA DEP, Western Regional Office.

¹⁵ Agreed in the 7/1/04 and 7/06/04 emails. As requested in the 7/6/04 email, a higher SO₂ rate also would be provided for cold start-up with oil, even though that procedure is not anticipated at this time.

GSG should note that the use of C&D debris, if it contains enough gypsum board, could raise SO₂ emissions above 0.035 and necessitate modification of the plant's pollution control methods.

In conclusion, DOER finds that Greenville's projected emission rates do appear to be "consistent with emission rates for comparable biomass units." DOER advises GSC to stay in touch with both Maine and Massachusetts DEPs, as well as to monitor Advisory Rulings and Statements of Qualification at DOER's RPS web page.¹⁶ Finally, DOER is likely to include emission limits, monitoring, and reporting requirements as conditions in the Statements of Qualification for all non-Massachusetts biomass units, including Greenville.¹⁷

6. Summary of Advisory Ruling

DOER has found Greenville Steam Company's proposed biomass retooling project, as currently described, to fall within the eligibility criteria for biomass-fueled New Renewable Generation Units provided in the RPS regulations at 14.05(1)(a)6. The following summarizes this finding, and it also notes several key issues and requirements for GSC to consider in its project planning. In reviewing an eventual Statement of Qualification Application, DOER will also consider these issues and requirements.

1. DOER finds the proposed fuels to be consistent with the definition of Eligible Biomass Fuels in the RPS regulations. The proposed fuel stream will consist of sawdust, bark, and wood chips from sawmill and forestry operations, as well as waste wood from licensed construction and demolition (C&D) debris processing centers. Ineligible fuel use will be discontinued, and it would be barred as a condition of any MA RPS Statement of Qualification.
2. DOER finds, pending details to be submitted with a Statement of Qualification Application, that the planned bubbling fluidized bed technology would qualify as an advanced biomass power conversion technology. This finding is consistent with the findings for the fluidized bed technologies in four other recent Advisory Rulings.
3. DOER finds that Greenville's proposed emission rates are "consistent with emission rates for comparable biomass units as prescribed by the Massachusetts Department of Environmental Protection." However, DOER advises the GSC to work with the DEPs of both Maine and Massachusetts and to monitor Advisory Rulings and Statements of Qualification at DOER's RPS web page. DOER is likely to include emission limits, monitoring, and reporting requirements as conditions in any Statement of Qualification for Greenville.
4. GSC should note that, while DOER may grant a Statement of Qualification for the re-tooled Greenville Generation Unit, the RPS qualification of the plant always would be contingent on GSC's obtaining any required ME DEP permit(s) for the proposed retooling and on its operating the plant in compliance both with those permits and with DOER's RPS regulations, including the conditions of the plant's Statement of Qualification. GSC should expect emission limits, monitoring, and reporting requirements to be included among those conditions.
5. Finally, GSC should note that, once DOER grants a Statement of Qualification, further advances in "low-emission, biomass power conversion technologies" would have no effect on the plant's MA RPS qualification.

¹⁶ <http://www.mass.gov/doer/rps/>.

¹⁷ Such conditions are included in the Statements of Qualification for the two Indeck plants and for Worcester Energy, three Vintage Generation Units located in Maine.